



## THE EFFECTIVENESS OF EDUCATIONAL INTERVENTIONS IN IMPROVING NURSES KNOWLEDGE OF DEMENTIA CARE: A SYSTEMATIC REVIEW

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### Abstract

As the global population ages, dementia has emerged as a pressing public health issue. Nurses play a pivotal role in dementia care; however, many lack adequate knowledge and confidence. Targeted educational interventions are essential to improve nursing competencies in dementia care. Objective this systematic review aimed to evaluate the effectiveness of educational interventions in improving nurses' knowledge, attitudes, and self-efficacy in dementia care. Methods: A systematic search was conducted across four databases Scopus, PubMed, ProQuest, and Science Direct following PRISMA guidelines. Studies published between 2020 and 2025 were screened using PICOS criteria and assessed for quality using the Joanna Briggs Institute (JBI) appraisal tools. Data were synthesized narratively. Results ten studies were included, consisting of quasi-experimental, RCT, and qualitative designs. Interventions such as digital games, virtual reality, simulation, mobile learning, and arts-based methods demonstrated improvements in nurses' knowledge, empathy, and confidence. Three major themes emerged: (1) enhanced knowledge of dementia, (2) improved attitudes and self-efficacy, and (3) deeper emotional engagement and humanistic understanding. Conclusion educational interventions particularly interactive and emotionally engaging formats effectively improve dementia-related competencies in nurses. These findings support the integration of innovative, person-centered training methods into nursing education and practice to enhance dementia care.

**Keywords:** *Dementia Care, Nurses, Educational Intervention, Knowledge, Attitude, Self-Efficacy, Systematic Review*

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INTRODUCTION

Dementia is an increasingly significant global health challenge, especially as the number of elderly people increases throughout the world (Holmes & Amin, 2020). As people age, a person's risk of cognitive decline increases, and at some point it can progress to dementia. This condition not only reduces the sufferer's quality of life, but also places great emotional, social and financial pressure on the family and the health care system(Igarashi et al., 2020). Data from the World Health Organization (WHO) shows that more than 55 million people are living with dementia, and this number is predicted to increase sharply to 139 million by 2050(World Health Organization, 2023). Data from East Java Province showed that the elderly population in 2014 is estimated to reach 10.96% and in 2015 it is estimated to reach 11.5% and by 2020 it will increase to 13.5% (Raufuddin, 2021).

This situation poses a major challenge for the health system, especially in providing early detection services, long-term care and psychosocial support. It is very important to have a preventive approach that can be widely reached and applied in everyday life. Although nurses play a crucial role in providing care for older adults with dementia, various studies have shown that their level of knowledge regarding dementia care remains relatively low (Lim et al., 2021). This lack of knowledge may affect the quality of care delivered, particularly in the context of community health services. It is essential to assess the extent of nurses' understanding especially community nurses in recognizing, managing, and appropriately addressing dementia cases(Rahmi et al., 2021). Many nurses still lack adequate knowledge, confidence, and comfort in dementia care, highlighting the need for targeted training to strengthen their competencies (Nguyen et al., 2024). Nurse and Nursing students' perspectives on the learning process significantly influence their motivation to reach goals, maintain focus, and comprehend complex information (Wati, 2024).

Improved training and education are essential to enhance nurses' knowledge and confidence in dementia care, as shown in studies from Taiwan and Bandung recommending targeted training and information dissemination (Andrews et al., 2024; Lin et al., 2018). Conventional training for nurses has proven effective in enhancing knowledge, attitudes, and self-efficacy in dementia care. Such training contributes to better patient outcomes, including more person-centered care and reduced behavioral challenges (Islam et al., 2020). Alternative training methods that match the effectiveness of conventional programs while offering greater accessibility and ease of use are needed to support wider implementation in dementia care.

Educational programs have shown potential in enhancing nurses' knowledge and certain competencies related to dementia care (Zhao et al., 2021). Nevertheless, their effects on attitudes, self-confidence, and psychological aspects remain inconclusive, highlighting the need for more robust and culturally varied research to determine effective approaches (Takeuchi et al., 2020). Effective

programs often include multifaceted components and practical support, highlighting the need for well-designed, comprehensive educational strategies (Toubøl et al., 2022). It is important to develop and evaluate an integrated and interactive mobile application- based education program (Natashia et al., 2025). Therefore, it is important to carry out a systematic study to evaluate the effectiveness of intervention that give to improve knowledge about dementia caring among nurse. Thus, a specific review on the effect of dementia intervention on nurses is essential to guide practice toward future training in dementia care.

METHODS

This systematic review was conducted according to PRISMA gui delines

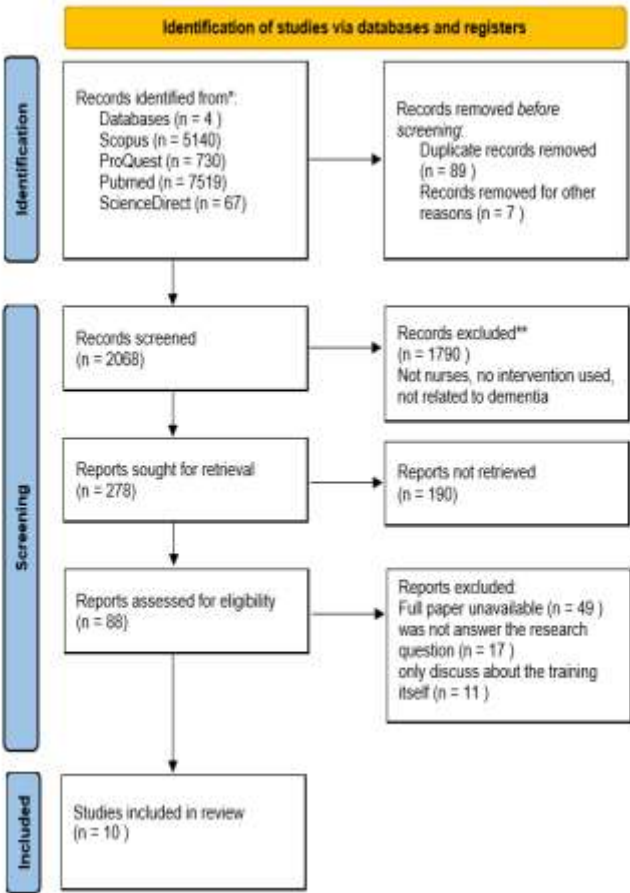


Figure 1 PRISMA flow diagram showing the screening and selection process

Seacrh Strategy

To identify all relevant studies, a systematic literature review search was perform using four database: Scopus, Pubmed, ProQuest, and Science Direct. Database were searched from inception until April 2025. Medical subject heading used in our search include ("educational intervention" OR "training" OR "education" OR "instruction") AND ("dementia" OR "Alzheimer's" OR "cognitive impairment" OR "neurodegenerative disease") AND ("nurse" OR "nursing" OR "healthcare professional" OR "caregiver") AND ("effectiveness" OR "impact" OR "outcome" OR "evaluation") AND ("care" OR "management" OR "support" OR "treatment")

Table 1 Search Strategy

atabase	Search Query	Hasil
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atabase	Search Query	Hasil
Scopus	("educational intervention" OR "training" OR "education" OR "instruction") AND ("dementia" OR "Alzheimer's" OR "cognitive impairment" OR "neurodegenerative disease") AND ("nurse" OR "nursing" OR "healthcare professional" OR "caregiver") AND ("effectiveness" OR "impact" OR "outcome" OR "evaluation") AND ("care" OR "management" OR "support" OR "treatment")	577
PubMed	("educational intervention"[All Fields] OR "training"[All Fields] OR "education"[All Fields] OR "instruction"[All Fields]) AND ("dementia"[MeSH Terms] OR "Alzheimer's"[All Fields] OR "cognitive impairment"[All Fields] OR "neurodegenerative disease"[All Fields]) AND ("nurse"[All Fields] OR "nursing"[All Fields] OR "healthcare professional"[All Fields] OR "caregiver"[All Fields]) AND ("effectiveness"[All Fields] OR "impact"[All Fields] OR "outcome"[All Fields] OR "evaluation"[All Fields]) AND ("care"[All Fields] OR "management"[All Fields] OR "support"[All Fields] OR "treatment"[All Fields])	1388
ProQuest	("educational intervention" OR training OR education OR instruction) AND (dementia OR Alzheimer's OR "cognitive impairment" OR "neurodegenerative disease") AND (nurse OR nursing OR "healthcare professional" OR caregiver) AND (effectiveness OR impact OR outcome OR evaluation) AND (care OR management OR support OR treatment)	132
Science Direct	("educational intervention" OR training OR education OR instruction) AND (dementia OR Alzheimer's OR "cognitive impairment" OR "neurodegenerative disease") AND (nurse OR nursing OR "healthcare professional" OR caregiver) AND (effectiveness OR impact OR outcome OR evaluation) AND (care OR management OR support OR treatment)	67

Eligibility criteria

The next step is to discuss based on the points obtained from the selection results(Zakaria et al., 2025) .The PICOS (Population, Intervention,

Comparison, Outcome, and Study design) framework was used to identify studies eligible for inclusion in this systematic review. The inclusion criteria were as follows: (a) Experimental study or primary study; (b) The topic was about dementia (c) The participant were nurse or at least some nurses involved (d) the outcome measured was on the nurses or allied health providers and not the training (e) articles published in peer-reviewed journals between 2020 and 2025 in the English language.

The exclusion criteria were: (a) the article does not discuss about training or program education, (b) Does not include nurse, (c) and does not relate to dementia. The author independently screened titles and abstracts against the eligibility criteria. Any discrepancies or disagreements were resolved through discussion and consensus, with the involvement of a third reviewer when necessary.

Study Selection and data extraction

A comprehensive search was conducted across four databases. All identified references were imported into Mendeley Desktop, where duplicate entries were removed prior to the initial screening phase. The screening process began with an independent review of titles and abstracts by the author. Studies that met the preliminary criteria were retrieved for full-text review. Any disagreements that emerged during the selection process were addressed through discussion and resolved in consultation with a third reviewer. Upon finalizing the list of included studies, the author independently extracted essential information, including author names, publication year, country of origin, study design, intervention setting, demographic characteristics of participants , intervention specifics , and reported outcomes.

Study Risk-of-bias Assesment

A comprehensive quality assessment of the included studies was performed using the Joanna Briggs Institute (JBI) critical appraisal tools, tailored to each study design. The evaluation considered methodological domains such as study design suitability, clarity of intervention and outcomes, consistency in measurement, handling of confounders, and data completeness.

Quasi-experimental studies were assessed using the JBI checklist consisting of 9 criteria. This checklist evaluates aspects such as clear definition of interventions, pre-post measurement, group similarity, and completeness of follow-up. Out of the eight quasi-experimental studies, five scored 8 out of 9 (89%), and three scored 7 out of 9 (78%), indicating generally high methodological quality across this group. Most studies clearly described their interventions and outcome measures, and conducted valid statistical analyses. However, common weaknesses included the absence of a control group and lack of detailed strategies to address confounding variables or missing data. Nevertheless, all quasi-experimental studies were considered methodologically robust enough for inclusion in the review.

The randomized controlled trial (RCT) was evaluated using the 13-item JBI checklist, which includes rigorous criteria such as appropriate randomization, allocation concealment, blinding, and use of intention-to-treat analysis. The RCT

study scored 10 out of 13 (77%), demonstrating moderate to high methodological quality. The study excelled in the use of randomization, pre-post measurement, and valid statistical analysis. Areas of concern included limited reporting on allocation concealment and blinding procedures, which could introduce bias. Despite these limitations, the RCT met the inclusion standards and provided strong evidence for its intervention.

Overall, the results of the JBI assessment indicate that all included studies surpassed the threshold for acceptable quality, with the majority scoring 78% or higher. The consistency in scoring, especially among quasi-experimental and qualitative studies, reflects strong methodological reliability. Studies with higher scores were generally characterized by robust design, appropriate analytical methods, and well-documented procedures, reinforcing the credibility of the findings and their inclusion in this systematic review.

Table 2 Quality Assesment JBI

No.	Author , Years	Study Design	1	2	3	4	5	6	7	8	9	10	11	12	13	Result
1.	(Craig et al., 2023)	Quasi-Experimental	√	X	X	√	√	√	√	√	√	√	√	√	√	7/9=
2.	(Craig et al., 2024)	Quasi-Experimental	√	X	X	√	√	√	√	√	√	√	√	√	√	78 %
3.	(Shieh et al., 2024)	Quasi-Experimental	√	√	√	√	√	√	√	√	√	√	√	√	√	7/9=
4.	(Wu et al., 2024)	Quasi-Experimental	√	√	√	√	√	√	√	√	√	√	√	√	√	8/9=
5	(Giebel et al., 2024)	Quasi-Experimental	√	X	X	√	√	√	√	√	√	√	√	√	√	8/9=
6	(Su et al., 2021)	Randomized Controlled Trial (RCT)	√	X	√	X	√	√	√	√	√	√	√	√	√	10/13=
7	(Seltmann & Teichmann, 2024)	Quasi-Experimental	√	√	√	√	√	√	√	√	√	√	√	√	√	8/9=
8	(Ayisi-Boateng et al., 2022)	Quasi-Experimental	√	√	√	√	√	√	√	√	√	√	√	√	√	8/9=
9	(Heward et al., 2021)	Quasi-Experimental	√	√	√	√	√	√	√	√	√	√	√	√	√	8/9=
10	(Schneider et al., 2020)	Quasi-Experimental	√	X	X	√	√	√	√	√	√	√	√	√	√	7/9=

Data Synthesis

This study adopts a narrative synthesis approach to integrate the findings from various reviewed articles. Data from each article were documented in a table containing details such as the author’s name, year of publication, research method, instruments used, and key findings related to the factors and dimensions of the study variables. In addition, content analysis was conducted by thoroughly reading each article and labeling relevant sections based on their context. These labels were then re-verified to ensure accuracy of meaning. Subsequently, all labels were compiled, mapped, and categorized to identify the main themes that emerged from the analyzed studies.

Results

Characteristics of included studies

Table 3 Characteristic of included studies

Study ID	Study Design	Country
(Craig et al., 2023)	Quasi-Experimental	Northern Ireland, United Kingdom
(Craig et al., 2024)	Quasi-Experimental	Northern Ireland, United Kingdom
(Shieh et al., 2024)	Quasi-Experimental	Taiwan
(Wu et al., 2024)	Quasi-Experimental	Japan
(Giebel et al., 2024)	Quasi-Experimental	United Kingdom (UK)
(Su et al., 2021)	Randomized Controlled Trial (RCT)	Taiwan
(Seltmann & Teichmann, 2024)	Quasi-Experimental	Germany
(Ayisi-Boateng et al., 2022)	Quasi-Experimental	Ghana
(Heward et al., 2021)	Quasi-Experimental	England, United Kingdom
(Schneider et al., 2020)	Quasi-Experimental	United States

Table 3 presents a summary of the characteristics of 10 studies included in the review. The majority of the studies employed a quasi-experimental design (n=8), while two studies used a qualitative research approach and one applied a randomized-controlled trial (RCT). Most studies were conducted in Europe and Asia, with countries including the United Kingdom (n=4), Taiwan (n=2), Japan, Germany, and Ghana. The United Kingdom was the most frequent location. One study was conducted in the United States. This diversity of geographic settings reflects a broad international interest in dementia and hospice-related care research across various healthcare systems. A total of ten studies met the inclusion criteria and were synthesized in this review. The studies were published between 2020 and 2024. The interventions varied in form, including serious digital games, virtual reality training, simulation-based toolkits, mobile e-learning with mentoring, short workshops, and arts-based approaches such as photobooks. These studies involved diverse participants such as nursing students, home care workers, hospital nurses, hospice staff, and professional trainers. The findings were categorized into three major themes: Knowledge about Dementia Several studies demonstrated that educational interventions significantly improved participants' understanding of dementia. Serious digital games, such as those used by (Craig et al., 2023), led to a measurable increase in knowledge across multiple domains. Similarly, the *Dementia Inequalities Game* (Giebel et al., 2024) not only enhanced dementia knowledge but also raised awareness of structural disparities. Studies by (Su et al., 2021)

and (Ayisi-Boateng et al., 2022) showed improvements in knowledge scores after mobile-based learning and a brief workshop, respectively. In addition, the *DEALTS2* simulation training (Heward et al., 2021) effectively improved trainers' dementia knowledge, particularly in humanized care approaches.

#### **Attitudes, Self-Efficacy, and Emotional Engagement**

A number of studies focused on enhancing participants' attitudes toward people with dementia and their confidence in providing care. (Craig et al., 2024) reported increased positive attitudes specifically in dimensions of hope and personhood after a digital game intervention. (Wu et al., 2024) found improvements in attitudes, intention to help, and confidence among acute care nurses who underwent VR-based dementia training. Similarly, (Su et al., 2021) and (Seltmann & Teichmann, 2024) reported significant and sustained changes in both self-efficacy and confidence. In hospice settings, (Schneider et al., 2020) found that the *Aliviado* program enhanced non-pharmacological intervention skills and caregiver confidence in managing BPSD and depression.

#### **Human Experience and Person-Centered Perspectives**

(Shieh et al., 2024) showed that emotional engagement during a digital board game enhanced learning outcomes and satisfaction. In a similar vein, (Heward et al., 2021) noted that simulation-based training promoted a more humanistic approach to dementia care, with the greatest learning gains seen in emotional and relational domains.

### **DISCUSSION**

This systematic review highlights the effectiveness of various innovative educational interventions in enhancing dementia-related knowledge, shaping positive attitudes, increasing self-efficacy, and fostering emotional engagement among nursing students and healthcare professionals. The use of game-based learning, virtual reality (VR), simulation, mobile learning, and arts-based tools reflects a pedagogical shift from traditional didactic methods to more interactive, learner-centered approaches. Professional education requires thorough preparation in developing educational content, effective use of information technology to enhance learning, and regular evaluation of student competencies to ensure they meet the minimum standards set by professional organizations (Khasanah et al., 2024). These elements are essential for maintaining the quality and effectiveness of dementia education, particularly when using innovative or interactive approaches. These methods are not only engaging but also cater to different learning styles, allowing participants to construct personal meaning and emotional connections with the subject matter particularly important in dementia care, which requires both cognitive and affective competencies.

Improvements in knowledge were a consistent outcome across the included studies. Digital games, mobile e-learning, and short but focused workshops effectively increased

participants' understanding of dementia concepts, symptoms, and care strategies. For example, (Craig et al., 2023) demonstrated significant gains in seven knowledge domains, while (Ayisi-Boateng et al., 2022) showed improved scores across all components of the ADKS. Another study also mentioned that educational game interventions can improve nursing students' knowledge, attitude, and helping behavior related to dementia (Sari et al., 2024). These findings support the growing body of evidence that suggests active learning strategies can enhance not only retention but also the depth of understanding in complex topics like dementia.

In addition to cognitive gains, several interventions also led to improvements in participants' attitudes and confidence in caring for people with dementia. Tools such as VR (Sari et al., 2020; Wu et al., 2024) and the *Lern von mir* training program (Seltmann & Teichmann, 2024) created immersive, emotionally resonant experiences that deepened learners' empathy and sense of preparedness. These findings reinforce the importance of addressing not only what learners know, but also how they feel and act toward individuals with dementia. Attitudinal change is particularly crucial in combating stigma, improving interpersonal communication, and fostering person-centered care in real-world clinical settings.

Furthermore, the review reveals the significant value of humanistic and arts-based educational approaches in dementia learning. The study by (Shieh et al., 2024) emphasized how emotional connection during gameplay enhanced satisfaction and motivation to learn. These forms of learning do more than convey facts they create meaningful experiences that resonate with learners on a personal level, which is essential when caring for vulnerable populations like people with dementia.

The collective findings of this review suggest that a multidimensional approach to dementia education one that integrates cognitive, emotional, and experiential elements is most effective in preparing health professionals. The reviewed interventions illustrate how technology, art, and simulation can be used not merely as tools, but as bridges between theory and practice, and between clinical competence and human compassion. As dementia continues to present global challenges across care settings, embedding these approaches into health education curricula becomes increasingly relevant and necessary to ensure dignified, person-centered care.

### **CONCLUSION**

Innovative, emotionally engaging methods such as digital games, simulation, and arts-based learning effectively improve dementia-related knowledge, attitudes, empathy, and confidence among healthcare students and professionals. Combining cognitive and affective elements enhances both clinical and relational skills. These findings support integrating interactive, person-centered education into nursing curricula and training to better prepare the workforce for compassionate dementia care.

LIMITATION

Although this review provides valuable insights into the effectiveness of various educational interventions for dementia care, several limitations should be acknowledged. First, the heterogeneity of study designs, intervention types, and outcome measures made it difficult to perform direct comparisons or statistical synthesis across studies. Most studies relied on self-reported questionnaires to assess knowledge, attitudes, and confidence, which may be subject to social desirability and response biases. Several studies demonstrated immediate post-intervention improvements, few assessed long-term retention of knowledge or behavioral change in clinical settings. Lastly, the geographical distribution of studies leaned toward high income countries, which may limit the generalizability of findings to resource limited settings.

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Appendix 1 Summary of included study

No.	Study ID	Intervention / Method	Study Design	Country	Main Outcome Theme	Key Findings
1	Craig et al. (2023)	Serious digital game	Quasi-Experimental	Northern Ireland, United Kingdom	Knowledge about dementia	Significant improvement in dementia knowledge across 7 domains (p < 0.001)
2	Craig et al. (2024)	Interactive digital game + ADQ	Quasi-Experimental	Northern Ireland, United Kingdom	Attitude toward PwD	Improved positive attitudes on Hope and Recognition of Personhood subscales after gameplay
3	Shieh et al. (2024)	Digital board game + observation	Quasi-Experimental	Taiwan	Knowledge & Emotional Engagement	Positive attitude enhanced learning; emotional engagement improved learning satisfaction
4	Wu et al. (2024)	Training program using VR	Quasi-Experimental	Japan	Attitude & Self-efficacy	Significant increases in attitude (41.9 → 44.5), helping intention (10.8 → 12.8), and self-confidence (25.9 → 29.2)
5	Giebel et al. (2024)	Dementia Inequalities Game	Quasi-Experimental	United Kingdom (UK)	Dementia Knowledge & Inequality Awareness	Significant improvement in dementia knowledge and awareness of inequalities (p < 0.001)
6	Su et al. (2021)	Mobile e-learning + mentoring	RCT	Taiwan	Knowledge, Attitude, & Competency	Significant and sustained increases up to 12 weeks in knowledge, attitude, and competency
7	Seltmann & Teichmann (2024)	“Lern von mir” training + follow-up	Quasi-Experimental	Germany	Knowledge, Attitude, & Self-confidence	Significant effects on all three variables; stable knowledge and confidence over time
8	Ayisi-Boateng et al. (2022)	4-hour educational workshop + ADKS pre-post test	Quasi-Experimental	Ghana	Dementia Knowledge	Increased ADKS knowledge score (19.8 → 23.2); significant improvement across all domains (p < 0.05)
9	Heward et al. (2021)	DEALTS2 (simulation & toolkit) for dementia trainers	Quasi-Experimental	England, United Kingdom	Trainer Knowledge & Confidence	Significant improvements in trainers’ knowledge and confidence; greatest effect in humanistic approach (p < 0.001)
10	Schneider et al. (2020)	Aliviado training program for hospice staff	Quasi-Experimental	United States	Knowledge & Dementia Symptom Intervention	Significant increases in knowledge, confidence, and non-pharmacological intervention for BPSD and depression